Strange Things Happening in the Frozen Arctic

Science Puzzled by Surprising News from the Far North Which Indicates That the Polar Sea Is Warming Up and the Great Ice Cap Is Slowly Melting Away Which May Soon Reveal the Hidden Secrets of the Unknown Polar Continent

Seals Leave Their Old Feeding Grounds Because the Water Is Too Warm and Vast Schools of Smelts Arrive Further North Than Ever Before, While Land Begins to Appear Which Has Always Been Covered by Ice

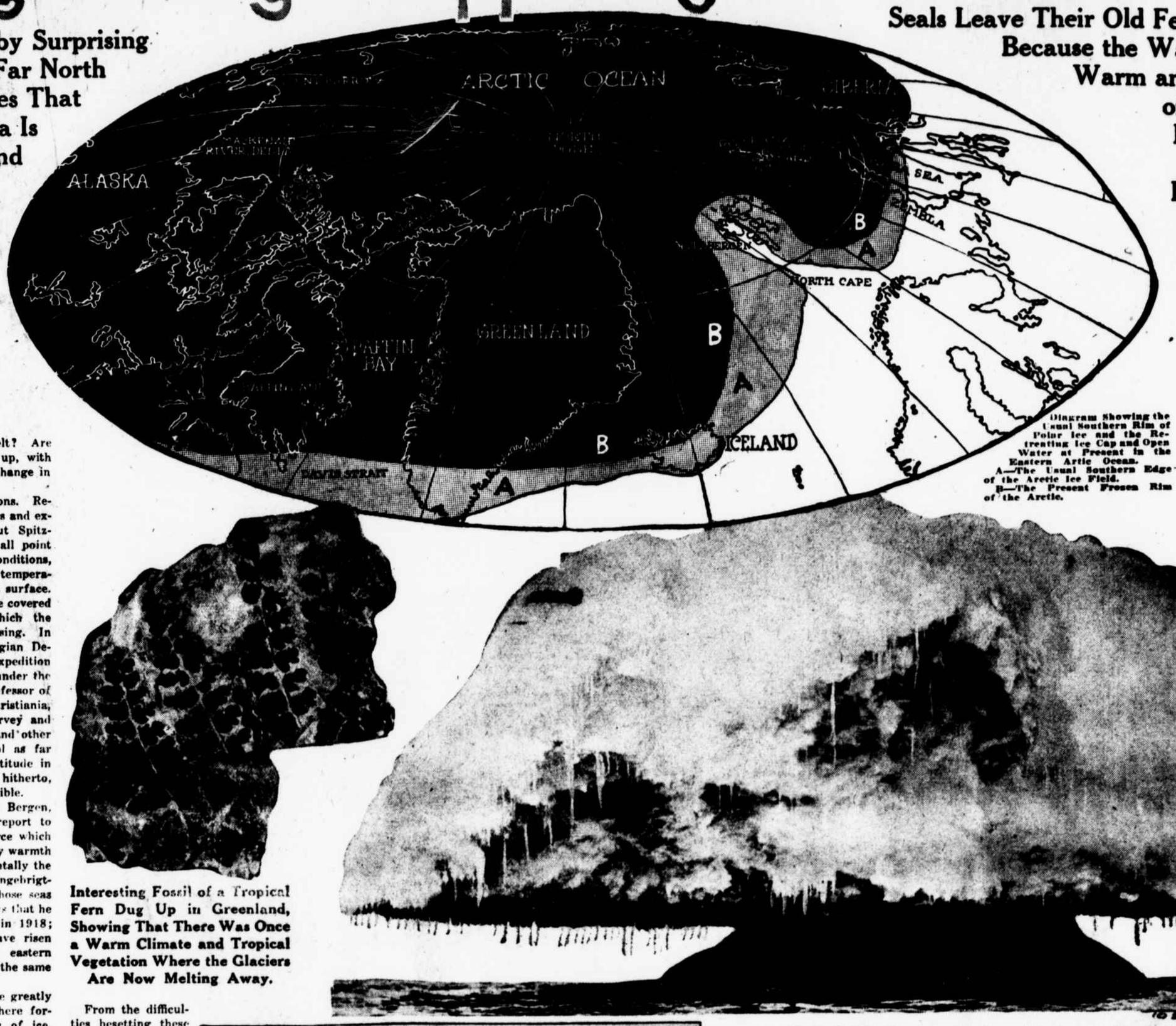
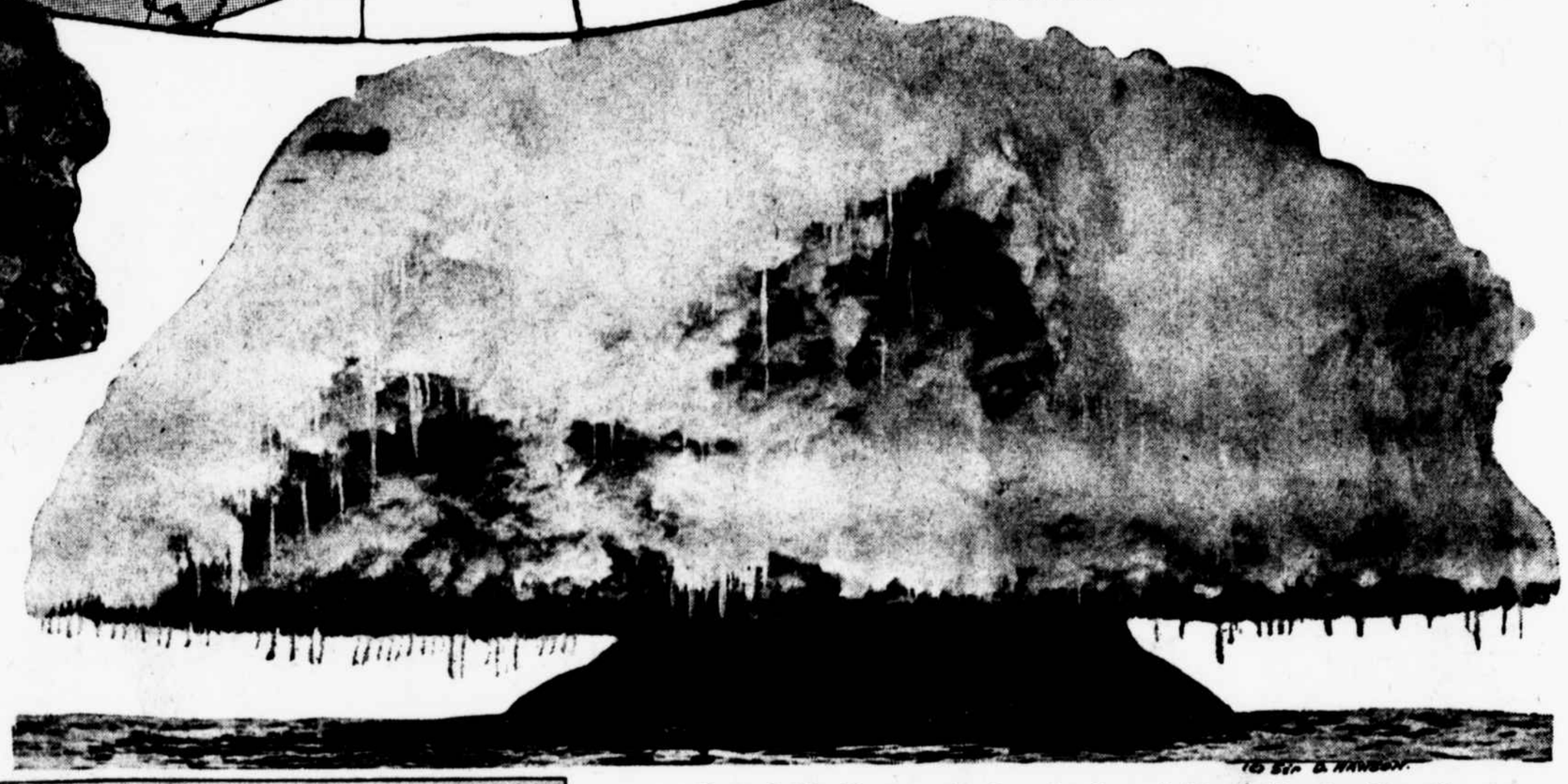


Diagram Showing the Usual Southern Rim of Polar Ice and the Retreating Ice Cap and Open Water at Present in the Eastern Artic Ocean.
A—The Usual Southern Edge of the Arctic Ice Field.
B—The Present Frozen Rim of the Arctic.

Interesting Fossil of a Tropical Fern Dug Up in Greenland, Showing That There Was Once a Warm Climate and Tropical Vegetation Where the Glaciers Are Now Melting Away.



Remarkable Photograph of an Ice-Capped Island, Showing How the Warmer Polar Sea Is Melting the Ice.

IS the North Pole going to melt? Are the Arctic regions warming up, with prospect of a great climatic change in that part of the world?

Science is asking these questions. Reports from fishermen, seal hunters and explorers who sail the seas about Spitzbergen and the eastern Arctic all point to a radical change in climatic conditions, with hitherto unheard-of high temperatures on that part of the earth's surface.

Observations to that effect have covered the last five years during which the warmth has been steadily increasing. In August of this year the Norwegian Department of Commerce sent an expedition to Spitzbergen and Bear Island under the leadership of Dr. Adolf Hoel, professor of geology in the University of Christiania, the object in view being to survey and chart areas productive of coal and other minerals. The expedition sailed as far north as 81 deg. 29 min. N. latitude in ice free water. Such a thing, hitherto, would have been deemed impossible.

The United States Consul at Bergen, Norway, Mr. Iltis, has sent a report to our own Department of Commerce which speaks of the recent extraordinary warmth in the Arctic. He quotes incidentally the statements of Captain Martin Ingebrigtsen, a mariner who has sailed those seas fifty-four years. The captain says that he first noted an unusual warmth in 1918; and since then temperatures have risen steadily higher. To-day the eastern Arctic is "hardly recognizable as the same region of 1868 to 1917."

Many of the old landmarks are greatly altered, or no longer exist. Where formerly there were great masses of ice, these have melted away, leaving behind them accumulations of earth and stones such as geologists call "moraines." At many points where glaciers extended far into the sea half a dozen years ago they have now entirely disappeared.

The change in temperature has brought great changes in the plant life and animal life of the Arctic. Formerly vast shoals of whitefish were found in the waters about Spitzbergen, but last Summer the fishermen sought them in vain. Seals, which used to be plentiful in those seas, have almost entirely disappeared. It would seem as if the ocean must have become uncomfortably warm for some of its denizens which formerly frequented those latitudes, causing them to flock northward toward the Pole.

On the other hand, other kinds of fishes, hitherto unknown so far north, have made their appearance. Shoals of smelt have arrived, and immense schools of herring are reported by fishermen along the west coast of Spitzbergen

Formerly the waters about Spitsbergen have held an even Summer temperature in the neighborhood of 5 degrees above freezing. This year it rose as high as 28 degrees. Last Winter the ocean did not freeze over even on the north coast of Spitzbergen. This is on the authority of Dr. Hoel.

This state of affairs is a cause of much surprise and even astonishment to scientists, who wonder whether the change is merely temporary or the beginning of a great alteration of climatic conditions in the Arctic, with consequent melting of the polar ice sheet.

An evidence of how great the change is that has come over the climate in the Arctic regions may be best understood by the struggles of the early explorers to discover the northwest passage, or the open body of water existing around North America, leading eventually to India. This passage was first undertaken by way of Spitzbergen, but the thick ice repeatedly beat back the ships of the explorers.

From exploits to discover the northwest passage many of the trips for the conquest of the North Pole were eventually undertaken.

Parry, the great British explorer, was first to negotiate the open passage between Greenland and Bering Sea, reaching half-way across the top of North America before he was hedged in by the ice, and with supplies becoming low, dared go no further.

He was first to discover the north magnetic pole and to report the astonishing fact that the needle of his compass turned and pointed directly south. For these discoveries Parry was awarded about $25,000 by the British Government and unquestionably his conquests in the frozen Arctic led to the actual penetrating of the northwest passage from the Atlantic to the Pacific by McClure, Collinson and Amundsen later on.

From the difficulties besetting these great Arctic adventures some idea of the tremendous thickness of the ice may be had. Even at the very spot north of Spitzbergen where open water was seen this Summer, such well-known explorers as Hudson and Phipps had great difficulties in penetrating on account of the thickness of the ice and, in spite of their equipment, one of them could not go even as far over the ice as the spot where the open water showed a few months ago.

Not only are the seals and polar bears finding the climate unpleasantly warm for them, but it is said that the eskimos in some localities are complaining and are finding their fur clothes too warm for them.

The region about the North Pole is covered by an ice cap which, toward the east, extends over nearly the whole of Greenland in what is practically a single enormous glacier. Greenland is ten times the size of the State of Pennsylvania, and from its vast ice sheet are derived the icebergs which float down from Baffin Bay and Davis Strait into the North Atlantic, threatening destruction to ships in the Spring of every year.

To cross this great Greenland glacier has been the quest of many adventurous spirits. On account of the severity of the winds that sweep over the immense slowly moving cake of ice, it was never successfully accomplished until Nansen managed to go from the east coast of Greenland across the top of the ice barrier to the west coast at about the sixty-fourth parallel of latitude.

Nansen and his five companions reached a height of 8,922 feet at the top of the barrier, showing how thick the ice had become through ages of freezing.

Later on Peary and Astrup crossed the island much further north and had to climb a solid hill of ice about 8,000 feet high.

The reason why we have these icebergs sloughing off from the southeastern tip of Greenland is evidently due to the north polar current carrying the ice mass from the north polar region along the land and keeping it at a very low degree of temperature down to Cape Farewell, the southernmost tip of Greenland. Here, during the Summer, the oncoming of the warm weather disintegrates some of the ice, particularly between the fissures, which are characteristic of each year's ice growth. Here they are spilt and carried away by the polar currents into the North Atlantic where sometimes they become very dangerous to ocean shipping.

It is a singular fact, and true of only this spot in the world, that the cold polar current that sweeps down the Eastern coast of Greenland is paralleled not very far outside by a warmer current, which is largely responsible for a considerable amount of precipitation that in turn has it effect in wearing down some of the glacial ice and bringing about the eventual formation of icebergs.

But there was not always an ice cap. In time long gone by the region about the North Pole had a warm climate and all of Greenland was covered with a luxuriant tropical vegetation. This is positively known because fossil remains of palms, breadfruit trees, and other plants properly belonging to warm latitudes have been dug up there in quantities.

Photograph of Land Which Has Appeared for the First Time in Greenland, and Which Has Always Heretofore Been Buried Under the Glaciers Which Are Now Melting Away.

The present Polar ice cap is but a remnant of what it formerly was. Thirty thousand years ago it extended over all of the northern half of the United States, in places thousands of feet thick and reaching as far south as Philadelphia and St. Louis.

It was a product of the Glacial Epoch—an age of cold, during which polar bears and reindeer were numerous in New York State, and walrus and herds of the dwarf Arctic cattle called musk oxen frequented the coast of New England.

Since that time the great ice sheet has been slowly melting at the edges, so to speak, and withdrawing northward toward the Pole. It retreated past Stockholm (say the geologists) not more than 9,000 years ago. If the process continues, the day may be expected to arrive when all the ice will be gone from about the Pole, and the Arctic regions will then become fruitful and habitable by man.

It seems at least possible that the extraordinary warmth in the Arctic during the last few years marks a step in this direction. Such a change as that suggested cannot be suddenly or even rapidly accomplished; but, if there shall come a time when the North Polar ice cap is entirely melted, and Greenland incidentally freed of the ice sheet which covers it, the latitudes in which we now dwell will experience a wonderful climatic alteration. The northern part of the United States will become sub-tropical.

From what has been said it will be understood that we are really still living in the Glacial Epoch. It seems, however, to be drawing gradually toward a close; and it is easily possible to imagine that eventually all parts of the earth will become warm again, just as was the case at the period above referred to, when Greenland was covered wtih a luxuriant vegetation.

Nobody knows what causes produced the age of ice. It must have been that the sun, for some reason, delivered less heat upon the earth. Though hard for us to realize, it is a fact that if the average temperature of the northern half of the United States were lowered only ten degrees, the ice sheet would creep southward again and cover all that part of the country, sweeping its cities off the map and giving it a likeness to the Greenland of to-day. This would happen because the difference of ten degrees would make the Winters so much longer that the snows would not have time to melt in Summer, and so the ice sheet would thicken year by year until it became one vast glacier.

So it is just as well that we find ourselves approaching the end of an age of ice, instead of being menaced by its oncoming. It is fairly to be expected that from this time on—judging from observations of the retreat of the great ice sheet—climates all over the world will become steadily and gradually warmer. No longer ago than 200,000 years the climate of Greenland was still temperate, and Alaska had temperatures like those of Alabama nowadays.

Not long ago two government geologists, David White and Charles Schuchert, paid a visit of exploration to west Greenland, where, far north of the Arctic Circle, they studied a fossil flora of palms, tree ferns, breadfruit trees, cinnamon trees, etc., belonging properly to the neighborhood of the Equator. Where now an ice sheet over a mile thick covers mountain and valley and mighty glaciers make their way to the sea and hatch icebergs, there was anciently a wilderness of tropical verdure.

There were trees related to the giant sequoias of our own west coast. Climbing vines festooned the trunks of these monarchs of an ancient forest with draperies of foliage, while close to the ground grew curious dwarf trees called "cycads" resembling palms in miniature, in the midst of a tangled undergrowth.

Of such a character was the vegetation of Greenland 5,000,000 years or so ago. White and Schuchert found the tropical plant beds overlaid by later deposits in which were masses of fossil remains of trees, including poplars, willows, eucalyptus and magnolias. Much of this material had been converted into "brown coal," or lignite. This latter formation was relatively recent, dating back only to the Tertiary Epoch when the climate of Greenland was much like that of our Gulf States to-day.

At the far more ancient period when Greenland was a tropical country the climate seems to have been much the same all over the world, and the same plants grew contemporaneously in Greenland and California, in Spitzbergen and Virginia. Nobody can say with certainty why this was. One theory is that in that epoch the atmosphere was so heavily charged with water-vapor that warmth was readily distributed through it, and the sun's rays did not have a chance to strike the earth uninterrupted, making differences in climate by the degree of their slant. As time went on, the atmosphere thinned gradually, and so there came to be climatic variations marking a series of zones around the world.

Of the fact that the Polar regions were anciently warm and verdure-clad an interesting proof was afforded by a discovery which Greely, the explorer, chanced to make. Within eight degrees (latitude) of the North Pole he found a fossil forest with stumps of trees still standing.

Greenland is the largest island in the world. It is mainly a granite formation, but some of the less elevated portions of it were evidently at one time below the level of the sea—as is proved by sedimentary deposits. In these deposits White and Schuchert found plentiful remains of marine animals, including fishes and extinct species of crustaceans.

At the period when Greenland was a tropical country there grew in waters along the New England coast species of corals which to-day are found only in latitudes not far from the Equator. They afford another proof that anciently climatic conditions were altogether different from what they are at the present time.

It is worth mentioning, by the way, that Dr. Adolf Hoel reports, as one profitable result of the recent Norwegian expedition, the discovery of hitherto unknown coal deposits, of great extent and superior quality, near the eastern shore of Advent Bay, in Greenland. These deposits, of course, represent a profuse plant life which existed through a great length of time in a former epoch.

Scientists declare that there have been in the past several glacial epochs. Apparently, owing to causes unexplained, long periods of cold have alternated with long periods of warmth. The prospect seems to be that one of these periods of warmth, which may last tens of thousands or even hundreds of thousands of years, is approaching; and in the phenomena now exciting so much attention in the Arctic may perhaps be seen a promise of changes that will beneficially affect the entire population of the world, incidentally rendering available for human occupation vast land areas which are now uninhabitable.